

# Data Reduction Techniques for Real-time Fault Detection and Diagnosis, and Multiple Fault Inference with Imperfect Tests, Phase II

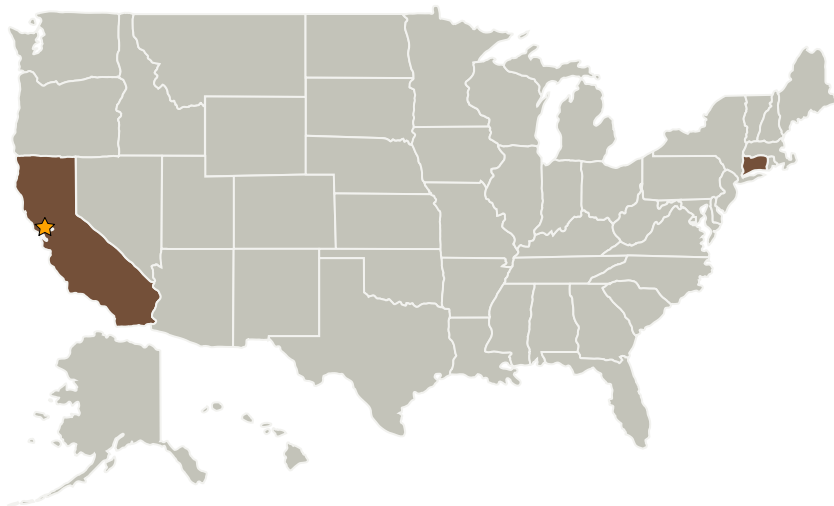
Completed Technology Project (2009 - 2011)



## Project Introduction

Limited downlink data rate constrains the amount of data that can be sent to earth from a spacecraft. Data from the onboard health monitoring sensors needs to be accommodated within a small fraction of this downlink bandwidth. The problem is more acute for interplanetary missions, where the downlink data rate is significantly lower than the low earth orbit missions. Such constraint prohibits transmission of the complete set of health monitoring data. This proposed Phase-II effort is geared towards providing enhanced remote diagnostics using limited telemetry bandwidth. Diagnostic accuracy of health management system depends more on the information content of the monitored data, than on its sheer volume. We propose accommodating more information within the allocated downlink bandwidth for health monitoring by performing intelligent data reduction. The onboard data reduction process employs sensor fusion, dimensionality reduction and temporal fusion techniques.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Qualtech Systems, Inc.	Supporting Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Rocky Hill, Connecticut

## Primary U.S. Work Locations

California	Connecticut
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## Project Transitions

 **June 2009:** Project Start

 **June 2011:** Closed out

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Ames Research Center (ARC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

## Technology Areas

### Primary:

- TX10 Autonomous Systems
  - ↳ TX10.2 Reasoning and Acting
    - ↳ TX10.2.5 Fault Diagnosis and Prognosis